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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/809,804	03/26/2004	Hiroshi Kanno	50024-030	7163

7590 08/21/2008

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EXAMINER
YAMNITZKY, MARIE ROSE

ART UNIT	PAPER NUMBER
1794	

MAIL DATE	DELIVERY MODE
08/21/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/809,804	KANNO ET AL.	
	Examiner	Art Unit	
	Marie R. Yamnitzky	1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 May 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4,7,9-14,16 and 18-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,7,9-14,16 and 18-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. This Office action is in response to applicant's amendment filed May 28, 2008, which amends claims 1, 13, 18, 23 and 24.

Claims 1, 4, 7, 9-14, 16 and 18-27 are pending.

2. The rejection of claim 24 under 35 U.S.C. 112, 2nd paragraph, as set forth in the Office action mailed January 28, 2008 is overcome by claim amendment.

The rejections under 35 U.S.C. 102(b) and 103(a) based on Mishima (US 2001/0053462 A1) as set forth in the January 28th action are overcome by claim amendment.

3. Claims 1, 4, 7, 9-14, 16 and 18-27 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Each of independent claims 1, 13, 18 and 23 has been amended to require the first host material (which is a host material in the long wavelength light emitting layer) to be an anthracene derivative or an iridium complex. The remarks accompanying the amendment indicate that support is found throughout the originally filed disclosure, and applicant points specifically to pages 19-25.

The examiner has considered the disclosure as a whole but is of the position that the combination of limitations set forth in the present claims is not fully supported by the application

as originally filed. With respect to applicant's specific reference to pages 19-25, page 19 shows the structure of a t-butyl substituted dinaphthyl anthracene compound which, per the paragraph beginning at p. 18, l. 10, is used as the host material in the blue light emitting layer for the embodiment described in this portion of the specification. The blue light emitting layer is the short wavelength light emitting layer, not the long wavelength light emitting layer. Even if the disclosure of this particular anthracene compound as a host of the short wavelength light emitting layer were to be considered as providing support for this particular compound as a host of the long wavelength light emitting layer, disclosure of a single specific anthracene compound does not provide support for the broader claim terminology of "an anthracene derivative" as a host material of the long wavelength light emitting layer. Regarding the possibility of an iridium complex as the first host material per the present claims, pages 19-25 do not disclose an iridium complex as a host material in the long wavelength light emitting layer (or as a host material in the short wavelength light emitting layer).

The examiner notes that none of the device examples set forth in the present specification provides full support for the present claims as none of the device examples meets all the limitations of the present claims. None of the device examples utilizes an anthracene derivative or an iridium complex as a host material in the long wavelength light emitting layer.

Clarification is required as to support for the presently claimed devices.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 4, 7, 9-14, 16 and 18-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Igarashi et al. (US 7,291,405 B2).

Applicant cannot rely upon the foreign priority papers that have a foreign filing date prior to Igarashi's U.S. filing date to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

Igarashi et al. disclose metal complexes for use as host materials in combination with phosphorescent metal complexes. The host materials may be iridium complexes, and several specific examples of iridium complexes useful as host materials are disclosed. See formulae (1-23), (1-24), (1-28), (1-46) through (1-52), (1-60), (1-63) and (1-64) in columns 16 and 20-23. The phosphorescent metal complexes used in combination with a metal complex host material may also be iridium complexes. For example, see column 3, line 3 and c. 10, l. 52-c. 11, l. 6.

The layer comprising the host material and phosphorescent material may also comprise one or more additional materials as taught, for example, in the paragraph bridging columns 25-26.

The devices of Igarashi's Examples 2, 4, 5, 6, 8 and 9 comprise a light emitting layer comprising an iridium complex as a host material and an iridium complex as a phosphorescent dopant material. The devices of Igarashi's Examples 2, 4, 5, 6 and 9 have a light emitting layer emitting blue or green light, as in the short wavelength light emitting layer of the present claims.

The device of Igarashi's Example 8 emits red light and, based on the identity of the phosphorescent dopant material (compound D having the structure shown in c. 29), the peak wavelength is inherently within the range of the long wavelength light emitting layer required by the present claims. Compound D further meets the limitations of the phosphorescent material as required by present claims 4, 16 and 25-27. The device of Example 8 does not further include an assisting dopant having a hole transport capability as required by present claim 1, but given Igarashi's teachings in the paragraph bridging col. 25-26, and Example 6 in which Compound E (which inherently has hole transporting capability) is used in combination with an iridium complex host material and an iridium complex phosphorescent dopant, it would have been an obvious modification to one of ordinary skill in the art to include one or more hole transporting compounds in a red emitting layer as in the Example 8 device.

Igarashi's exemplary devices have only one emitting layer. However, as taught at c. 26, l. 29-31, the device may have more than one light emitting layer, with different layers emitting different colors so as to "emit, for example, white light as a whole". It would have been within the level of ordinary skill of a worker in the art at the time of the invention to determine appropriate combinations of materials (with respect to specific materials to be combined as well as relative amounts of different materials to be combined) to be used to provide a device having more than one light emitting layer so as to achieve an effect such as white light emission. For example, Igarashi's exemplary devices other than that of Example 8 emit blue or green light. The wavelength range for the short wavelength light emitting layer encompasses blue and green light. It would have been an obvious modification to one of ordinary skill in the art at the time of

the invention to make a device having different light emitting layers by stacking the red light emitting layer of the Example 8 device with a blue or green light emitting layer of one of the other exemplary devices, and to include one or more additional materials in either layer within Igarashi's guidelines.

With respect to the tris(2-phenylquinoline)iridium compound required by present claim 7, Igarashi's Example 8 utilizes a similar iridium compound having two 2-phenylquinoline ligands, and an acetylacetonate ligand in place of the third 2-phenylquinoline ligand required by the claim 7 structure. Tris(2-phenylquinoline)iridium compounds as required for claim 7 were known in the art at the time of the invention to be suitable for the same purpose as Igarashi's Compound D. It would have been an obvious modification to one of ordinary skill in the art at the time of the invention to use other known iridium complexes of 2-phenylquinoline in place of Compound D to provide similar devices.

With respect to the ratio of maximum peak luminous intensity as recited in present claims 12 and 22, it would have been within the level of one of ordinary skill in the art at the time of the invention to determine suitable compositions for different light emitting layers so as to provide an appropriate ratio of peak emission wavelengths from the layers so as, for example, to provide a white light emitting device.

With respect to the relative HOMO energy levels recited in present claims 10 and 20, it would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to select combinations of materials having appropriate relative HOMO energy levels so as to affect movement of holes to the phosphorescent material, the movement of holes to the

phosphorescent material being a necessary requirement in order to achieve light emission from the phosphorescent material. For example, as taught at c. 25, l. 56-66, three or more materials may be used in combination in the light emitting layer as long as the layer is capable of receiving holes, receiving electrons, and recombining holes and electrons so as to provide light emission.

6. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (571) 272-1531. The examiner works a flexible schedule but can generally be reached at this number from 7:00 a.m. to 3:30 p.m. Monday-Friday.

The current fax number for all official faxes is (571) 273-8300. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (571) 273-1531.)

/Marie R. Yamnitzky/
Primary Examiner, Art Unit 1794

MRY
August 18, 2008